SUMMARY.

The K-emission spectra of Be, B and C, and the L-emission spectra of Al and Si of the pure elements in the solid state and some compounds are investigated. The spectra exist of broad lines, due to the broad energy-level, which is occupied by the valency-electrons. As to the pure elements, it could be understood, why the insulators have emission lines which gradually diminish in intensity at both sides (fig. 18). The conductors, however, have emission lines which at the short wave-length side have a sharp edge (the intensity falls suddenly from a given value to zero). This edge corresponds with the energy up to which the valency-band is filled (fig. 5, fig. 8, fig. 13, fig. 16). It is of interest to notice that it may be concluded from the K-line of B that this element has to be a conductor.

It is pointed out that in the case of a compound not only the density of the energy states in the valency-band but also the transition probability plays a role in determining the form of the emission line. In this way we can understand why the beryllium K-lines of BeO (fig. 6) and $BeSO_4$ (fig. 7) are nearly identical, whereas the crystal lattices of these compounds are totally different. The same can be said of B_2O_3 (fig. 10) and $Na_2B_4O_7$ (fig. 11).

Some special questions are discussed in detail. The carbon K-line in SiC has a sharp edge, this is in agreement with the fact that SiC is a conductor.

A new diffuse and faint emission line of Be in BeO lying on the long wave-length side of the ordinary K-line of this element has been found. It is interpreted as a $K \rightarrow L$ transition.